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A design-relevant mindfulness device

Fernando Rojas [a], Stuart English [a], Robert Young [a] & Nicholas Spencer [a]

[a] Northumbria University School of Design

Abstract: This paper delineates a study that aims to describe the development and measure the effects of a design-relevant mindfulness device. The relational nature of design and particularly multidisciplinary collaboration, implies that designers would benefit from the development of interpersonal skills. Science suggests that one of the benefits of mindfulness is improved interpersonal skills which could lead to enhanced cooperation disposition. The mindfulness device becomes relevant to design through a process of intra-personal attuning that focuses attention on embedded values which impact awareness. The study aims to determine whether engagement with the device has significant effects on, and noteworthy correlations between aspects of mindfulness and of cooperation. Moreover, the study will generate reflective output that is expected to map designers' conscious and subconscious values. This paper also explores how developing this skill may transform a designer's relationship with tacit knowledge arising in intuitive design moments.

Keywords: Mindfulness, Design Skills, Design Learning

1. Introduction

Design literature refers to mindfulness as a competence that should be explicit in design academic settings to support contemporary co-creative approaches (Howard & Melles, 2011; Owen, 2007; Norman, 2010; Young, 2012). The relational nature of design and especially on multidisciplinary collaboration, presupposes that designers would benefit from the development of interpersonal skills. Mindfulness disposition has been associated with improved interpersonal relationships (Siegel, 2012). Furthermore, mindfulness literature suggests that the qualities that characterize a mindful-attitude are also characteristic of creative thinking (Langer, 2014; Langer & Piper, 1987). It would be reasonable to infer from these statements, that the nature of a designer's training and experience would promote mindful-awareness disposition and therefore enhanced interpersonal skills. It could be argued that experience in design helps develop mindful attitudes overtime. Yet, the clash of egos has also been put forward as a core dysfunction of collaboration-based design activity (Vyas & Young, 2011; Young, 2012).

In this light, this paper delineates the design of a study that aims to describe and measure the effects of a mindfulness device in a way that is relevant to design. From this perspective, this doctoral

project seeks to: (1) recount the iterative process of development of a design-relevant mindfulness device; and (2) establish whether this application of mindfulness yields significant results in reference to tendencies towards mindful awareness, and towards cooperation. It is the interest of this doctoral project that the mindfulness device: (a) embodies recognized components of mindfulness practice which are pertinent to design; and (b) that its application yields results that establish whether they validate its fostering of the described tendencies, and the potential correlations between discrete facets of mindful and of cooperative attitudes.

This paper is organized around two general topics: (1) the rationale behind the evolution and composition of the design-relevant mindfulness device, and (2) the study's proposed data generation, measurement and analysis. This paper also concludes that a mindful process of self-exploration may transform subconscious aspects thought to impact design decisions and therefore encourage innovation.

2. A Design-Relevant Mindfulness Device

2.1 Intra-personal attuning as Mindfulness

Mindfulness, as a disciplined practice based on Eastern philosophy, leading to certain mind states or attitudes, and its resulting physiological and psychological effects is currently widely discussed in research literature as well as in mainstream media. It can be viewed as ways to train the mind to focus attention in particular ways (Siegel, 2010; 2012), and thus encourage decision-making to be less automatic, or less mindless (Langer, 2014). Overviews of the varied descriptions and research streams around the concept, as well as critical analysis of the interrelationships between aspects of mindfulness and of design have been discussed in depth in previous publications (Rojas, English, Young & Spencer 2015; 2016). As part of this doctoral programme, approaches to mindfulness were analysed and explored in an effort to adapt and integrate a form of the discipline to design contexts. The study's final version of the mindfulness device follows a perspective that suggests that mindful qualities of attention emerge out of intra-personal attuning of individuals to permeate relational contexts and foster interpersonal benefits (Siegel, 2007; 2009; 2012; Parker, Nelson, Epel & Siegel, 2015).

Siegel (2010; 2012) devised the concept of The Wheel of Awareness (figure 1) as a form of mindfulness that fosters intra-personal attuning; a process that trains the mind to recognise and differentiate amongst diverse elements of self-perception the sense of knowing from the sense of that which is known. Another way to explain it is to view the individual self as a system and recognize the individualities that differentiate an "observing-self" (Deikman, 1982) from the object(s) of observation. From a systems perspective, upon differentiation then comes "linking" which is a task of acknowledging the relations between the objects of perception and of the observing entity as parts forming a complex whole. In the original Wheel of Awareness mindfulness exercise, the objects of observation are described as "senses": (1) the five senses (sight, hearing, olfaction, taste, and touch); (2) the sixth sense or interoception (perception of the interior of the body); (3) the seventh sense (thoughts, emotions, attitudes, beliefs); (4) the eighth or relational sense (sensations of our connections with others).

Siegel proposes that this practice promotes consciousness integration, and defines it as the linkage of differentiated parts of a complex system. In his view, non-integrated complex systems can lead to chaos, rigidity or both. In an integrated system, subsets of a collection of elements become unique (or specialized) in their individuality and then interact with each other to form a complex whole. This

may lead to self-organization as an emergent property of the interactions of elements of the system. Finally, the functions of the elements are influenced by the emergent self-organization moving the system towards 'maximizing complexity', or to harmonious interaction of unique elements (ibid). In the context of mindfulness, and of considering the self as a system, differentiation of discrete kinds of contents of the mind is activated by focused attention, linking an observing-self with an experiencing-self, and leading to internal (or intra-personal) and interpersonal attuning. Siegel explains:

> "Sensing the inner states of mind of another alters our own inner state. Therefore, looking toward our own inner world serves as the source of empathy for others' mental experience. Hence, reflection is both an inner and interpersonal gateway to insight, compassion, and empathy." (ibid)

In order to make the final version (figure 2) of the device relevant to design, the objects of observation are substituted for those that are thought to impact design choices: embedded personal and professional values and beliefs. This is rooted on the notion that most mental information processing is automatic (mindless) and that it's influenced by these values and beliefs held (Kahneman, 2011). A designer's set of personal and professional values and beliefs are considered important to the process of design, are said to emerge unconsciously, to impact, and to direct the framing of design problems (Akama, 2012; Lawson, 1997; Strickfaden, Rodgers & Langdon, 2006; Young, Blair & Cooper, 2001).

Upon engagement with the device, participants are encouraged to differentiate what seems important at the time of reflection and to assign those values to a role or self-aspect (McConnell, 2011) that is prevalent in their personal and/or professional realms. Capra & Luisi (2014) propose that diverse individual inner conceptions of the self are real and yet, are not separate entities. They frame this around a systems understanding of life, as an inner world of reflective consciousness containing a multitude of interrelated characteristics (ibid p.304). Conceivably, this process promotes a sense of interconnectedness where, like Siegel (2012) proposes, whilst some of the identities in an individual may have seemingly contradicting values, they are inherently part of the same complex self-system.

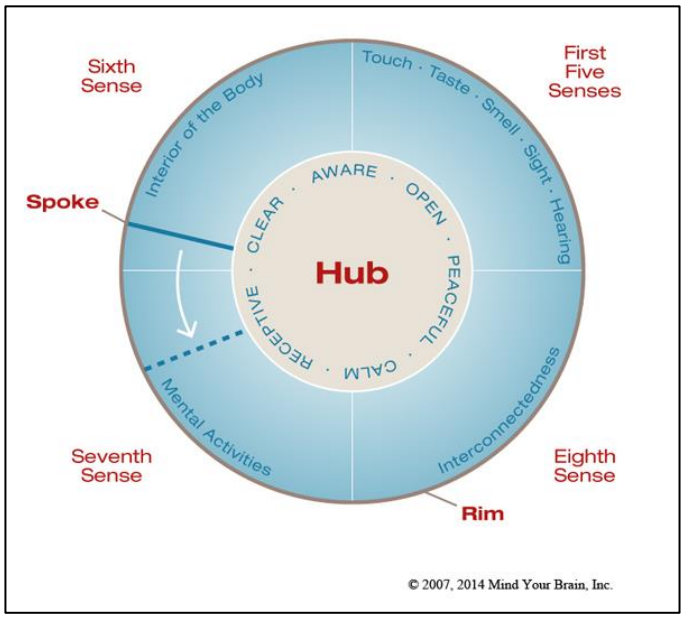

Figure 1. The Wheel of Awareness. "The hub represents the experience of awareness itself — knowing — while the rim contains all the points of anything we can become aware of, that which is known to us. We can send a spoke out to the rim

to focus our attention on one point or another on the rim. In this way, the wheel of awareness becomes a visual metaphor for the integration of consciousness as we differentiate rim-elements and hub-awareness from each other and link them with our focus of attention" (Siegel, 2016).

Figure 2. The final design-relevant mindfulness device where the objects of attention are a designer's personal and professional values.

2.1 Early Iterations

In the initial stages of the application's development, adopting viewpoints of a mindfulness research stream known as socio-cognitive mindfulness (Yeganeh & Kolb, 2009; Djikic, 2014), master level design students were encouraged to capture stakeholder perspectives of their current collaborative project through dynamic visual maps in a reciprocal way. These reflections were named Reciprocal Perspectives (RP's), as the conceived mindful activity influenced by the concepts of re-categorizing and relabelling, in opposition to mindless rigid reliance on old categories (Langer, 2014). RP's, which also embody elements of Appreciative Inquiry (Cooperrider & Whitney, 1999), are understood as possibility propositions that bridge the best of "what-is" with collective speculation of "what-might-be". RP's describe what works in a system and change negative accounts into descriptive points of view and into new possibilities. The assumption for this approach is that a system is not a problem to be solved but a mystery to be embraced by paying attention to novelty and questioning assumptions. RP's were presented to design students in the following way:

1. RP's describe and value what works in the current system and uses that as a base to envision what might be and dialogue what should be.
2. RP's re-label negative accounts into descriptive points of view and/or into new possibilities. For example:

- "The glass is half empty" to "the glass is half full"
- "The glass is half empty" to "the glass has water"
- "The glue does not adhere as expected" to "the glue adheres for a short amount of time"

Whilst this exercise clearly be viewed as a mindful process, it was determined that the device required an element which is deemed essential to the quality of attention people apply to their actions within systems; inner-focus or as referred to in this document, internal views (Goleman, 2013; Scharmer & Kaufer, 2013). Contemporary co-creative approaches promote that more

stakeholders participate directly in the creation of a design outcome (Maase & Dorst, 2006; Young, 2012; Hocking, 2011) and whilst RP's promote mindful consideration of multiple stakeholders, they do not naturally include deliberate attention to the design component's internal views. Consideration of these multiple stakeholder perspectives are understood in this paper as external views from the standpoint of the design component. Internal views are understood as a self-observing capacity of individuals and teams in co-creative contexts, and described by Scharmer & Kaufer (2013) as a way to help a system see itself and connect to its emerging future self. This, in their view, is accomplished by connecting different views simultaneously, and "bending the beam of attention" back to the observing-self and to the sources of creativity.

A revised version of the mindfulness application reflected this attempt to scrutinise internal views within the design problem framing by highlighting the role of the design component within a framework of stakeholders called the creative consortia (Spencer, 2015). This framework is conceived whilst operating under the recognition that multidisciplinary and multi-stakeholder collaborative teams are the best way to co-create for social innovation. It comprises 4 pillars of a quadruple helix for the creation of social value that are: society (citizens), university (student design team), industry and government. Here, they suggest design acts as a connector-integrator to create the right environment for collaboration. If in a co-creative context, the design component leads the design process and collaboration effort, then arguably, it is through this design component that mindfulness elements must be integrated. Goleman (2013) describes a leader's Triple Focus as vital attention abilities. These are: (1) inner-focus, which fosters self-awareness and self-management, (2) other-focus, which fosters empathic-awareness, and (3) outer-focus, which fosters systems awareness. He states:

> "Inner focus attunes us to our intuitions, guiding values, and better decisions. Other focus smooths our connections to the people in our lives. And outer focus lets us navigate in the larger world. A leader tuned out of his internal world will be rudderless; one blind to the world of others will be clueless; those indifferent to the larger systems within which they operate will be blindsided." (Goleman, ibid)

Co-creation in the context of the creative consortia is by definition an approach that aims for sustainable systems awareness and social innovation outcomes. Therefore, the outer-focus is assumed to be the genesis of the scope of a co-creative process that aims for social innovation. The relevant additional attention-training aims would apply to the inner-focus and other-focus of the design component and stakeholders in their participatory interactions. The concept of the creative consortia is a proposition for managing complexity of a multi-stakeholder value system. This approach posited that design, as a connector-integrator, can promote integration through an adaptation of The Wheel of Awareness as described previously. If this concept is interpreted and extrapolated to understand the creative consortia as a complex stakeholder system, how can this system be integrated through mindful intervention of a design connector-integrator?

The discrete aspects of this system (to be differentiated) are people with values pertinent to their multiple roles or identities; and the way they interact (link) is through communication. Consequently, attuned-communication, defined by Siegel (2012) as the quality of integrative relationships in which differences are respected and compassionate connections are cultivated, is a highly desired outcome. In the original wheel model the hub represents space to pause and reflect. This application proposed an adapted visual metaphor, where the hub is the design connector-integrator, providing the space for recognition of all stakeholders' uniqueness and encouraging attuned connections. The process aimed to promote attuned communication through differentiation and linkage of the components of the creative consortia, where the discrete components are people recognizing their

roles and values, whose interaction is through communication. The metaphoric hub is the design component, as the connector-integrator, and the constituents of the rim are stakeholder members of society (citizens), industry and government as it may relate to the particular design brief (figure 3).

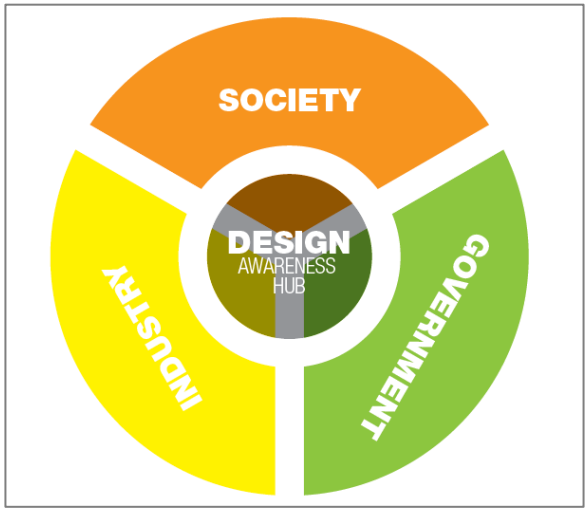

Figure 3. The creative consortia with the design component as a connector-integrator as the hub, and industry, society and government as constituents of the rim.

Students were encouraged to capture stakeholder perspectives using internal and external system views as the mindfulness component. External systems views consist of the project brief sets of stakeholder perspectives including the design team as a stakeholder set (and as the source of internal systems views). Internal systems views consist of a designer's personal and professional values and beliefs. Ideally, as the map grows and morphs dynamically, and categories form to clarify values further, each category becomes a new centre-of-inquiry (figure 4).

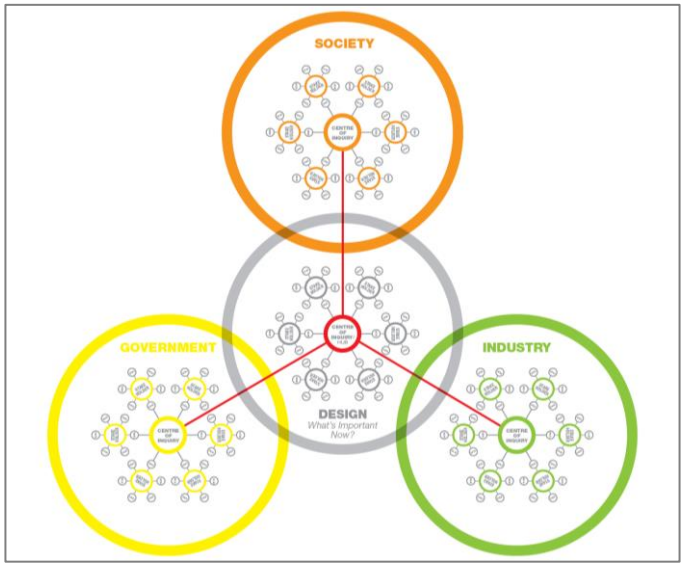

Figure 4. Each centre-of-inquiry around the design hub is a distinct radiant mind map.

These initial conceptualizations of the intervention within a design class, visualized the device as a design problem framing tool imbued with mindfulness techniques. The goal was to effectively include internal views as part of the considered design problem context. This process appeared to be

perceived as foreign or unnatural, and bring too many aspects for consideration and interpretation by the students when added to other new processes of learning collaboration-based design approaches running in tandem. It seemed bound to cause confusion and to be viewed as a burden.

This lead to the final iteration of the device which whilst it promotes a mind training discipline relevant to design concerns, for the purpose of the study it remains less intrusive, does not interfere directly, yet runs parallel to other current taught approaches as a process of discovery of unobserved individual values and beliefs. Ultimately, the interest of the study is to determine whether the design-relevant mindfulness device has significant effects and/or correlations between mindful and cooperative disposition. In this case opportunities are potentially created for the prospective evolution of self-contained academic tools pertinent to design which foster distinct skills and behaviours in design students.

2.2 Final Mindfulness Device

To engage with the device, participants are asked to find a time every day to reflect with the following guide. Since this is a new discipline that aims to be inserted in a daily schedule, it was suggested that reflection times be attached to an existing daily discipline (i.e. before or after a meal, or upon arrival to school or work, or before going to bed, etc.):

Step 1: A Self is understood as a role or identity. Start with an Observing Self node and split it in two categories: Personal and Professional. The Observing Self represents the entity from where you are able to see your other roles. For example, you can identify one of your Professional Selves as a Design Team Member; and a Personal Self as a Cycling Enthusiast. And you can observe both from your Observing Self role.

Step 2: Bring your awareness to your Observing Self role and ask yourself: What seems important now (to either a personal or professional self)? See what arises. There are no wrong answers. For example, let's say your first thought was: "I'm concerned that the due date is approaching and we need to finish the concept". Now select a self, or role or identity in your life you think this can belong to. For instance, this particular concern can belong to a Design Team Member Self, which is a Professional Self.

Step 3: Now decide what value you think this first concern belongs to. It may help to consider it as "an appreciation for..." or "a belief in...". In this example Timeliness was chosen. Choose a value you are comfortable describing. Again, there are no wrong answers. Since this is a daily exercise, it is possible that values might refine overtime. Go back to your Observing Self role and ask yourself the question again: What else seems important now? See what arises.

Step 4: It is up to you to discover which Self and which Value, your next thought belongs to. In this example, for illustration purposes, Cycling was chosen as the Self (personal) to which the second thought or concern belongs to. And the value, Discipline. This is assuming you were a cycling enthusiast and your next thought was about keeping up with your training.

To complete the exercise for the day, participants are asked to complete a form with the selves and the values arising from the reflection. A minimum of two (2) Self/Value combos are suggested, but they were encouraged to do as many as time and their comfort allows. The reflection output for the examples offered would be:

- Self or Role: Design Team Member | Value: Timeliness; and
- Self or Role: Cycling | Value: Discipline

This reflection content offers insight on what participants discern to be significant in their perception as they move between their designing role and other life identities. As a mindfulness exercise, the activity promotes recognition and differentiation of the knower (the Observing-Self) from the known (the Object of Observation). Relevance to design is accomplished by making the objects of observation to be elements that impact design choices: personal and professional values and beliefs.

Starting from their understanding of what the experience of the Observing-Self is, potentially promotes a reflective process that encourages points of view that are not habitual. Waiting to see what arises as important, creates a mental space between the question and the next emerging thought. And matching the value to a personal or professional role that they perceive it belongs to, offers an experience opportunity of recognition of a self with a multitude of interrelated aspects.

To measure the effects and correlations of this engagement, the study design is experimental comparing test and control groups with pre-test/post-test interventions.

3. The Study

This doctoral project seeks to establish whether a design-relevant mindfulness device in collaboration-based design contexts, yields significant transformational and correlational results. Such results will be considered in the context of both general and discrete tendencies: (1) towards mindful awareness; and (2) towards cooperation. The experimental study consists of a mindful awareness device adapted to be relevant to design concerns, together with the application of two instruments, widely recognized in research, measuring facets of mindfulness and modes of conflict-resolution.

The mindfulness instrument is known as the Five Facet Mindfulness Questionnaire (FFMQ) and has been used in numerous mindfulness studies (Park, Reilly-Spong & Gross, 2013). The instrument is based on five independently developed mindfulness questionnaires that are bound together in a factor analytic study. The study posits five clear and interpretable facets of mindfulness: observing, describing, acting with awareness, non-judging of inner experience, and non-reactivity to inner experience (Baer, 2006). Further studies have supported the FFMQ's construct validity (Baer, Smith, Lykins, Button, Krietemeyer, Sauer, Walsh, Duggan & Williams, 2008; Baer, Samuel & Lykins, 2011).

The conflict-resolution instrument, known as the Thomas-Kilmann Conflict Mode Instrument (TKI), has been refined over 40 years to reduce social desirability bias (Kilmann & Thomas, 1977). This instrument is designed to differentiate between specific intentions for handling conflict, and identifies five main modes of resolution: competing; accommodating; avoiding; collaborating; and compromising. These five modes are defined according to two basic behavioural dimensions of assertiveness and cooperativeness (Kilmann & Thomas, 1975; Thomas & Kilmann, 1978).

The general transformational context refers to the measurement of overall tendency towards mindfulness disposition (FFMQ), and of overall tendency towards either assertiveness or to cooperativeness in conflict situations (TKI). Assertiveness is understood as an attempt to satisfy one's own concerns via a more egocentric approach, whilst cooperativeness is understood as an attempt to satisfy others' concerns via a more eco-centric approach (TKI). It would be reasonable to assert that a tendency towards cooperation would be a more desired approach in a multi-stakeholder co-creative endeavour. Transformation will also be measured in the context of discrete or individual facets of mindfulness, and of modes of conflict-resolution. The facets are aspects from previous studies that appear to represent elements of mindfulness and they consist of: observing; describing; acting with awareness; non-judging of inner experience; and non-reactivity to inner experience (FFMQ). The described modes for responding to conflict situations consist of: competing; accommodating; avoiding; collaborating; and compromising (TKI). Potential correlations will then be drawn upon the measured results of individual facets and modes as described, to enable conclusions specific to the relationships between discrete elements representing tendencies towards mindful awareness and towards behaviour in situations of conflict.

Also, as discussed, reflective content is generated as part of engagement with the mindfulness application. This output is expected to offer a sense of what kinds of values designers perceive as important whilst moving between designing and non-designing roles.

4. Conclusive Remarks

Mindfulness, applied to design concerns, can be understood as way to promote more visibility and consideration of information impacting design choices. Personal and professional values and beliefs have been proposed by Lawson (1997; 2004) to constitute a set of design guiding principles developed overtime. These embedded values operate subconsciously and arise along with tacit skilled knowledge in designing. Thus, a mindfulness discipline encouraging that design guiding principles be made visible and explicit, can arguably impact a designer's awareness and transform subconscious tendencies that arise during the design process. Perhaps it could be said that the value of mindful awareness is not as a substitute to reactions, but as a skilled relationship with the inevitability of know-how arising in intuitive design moments such as flow, knowing-in-action or reflection-in-action. This study asks whether there is value in developing the skill to consciously explore these subconscious aspects.

English (2010) described a model (figure 5) for navigating fuzzy situations that draws together several theories of perception and communication. The Subjective Universal, where conceptual neural patterns are created from conscious and subconscious components, is where mindfulness can have transformational potential in the designing space.

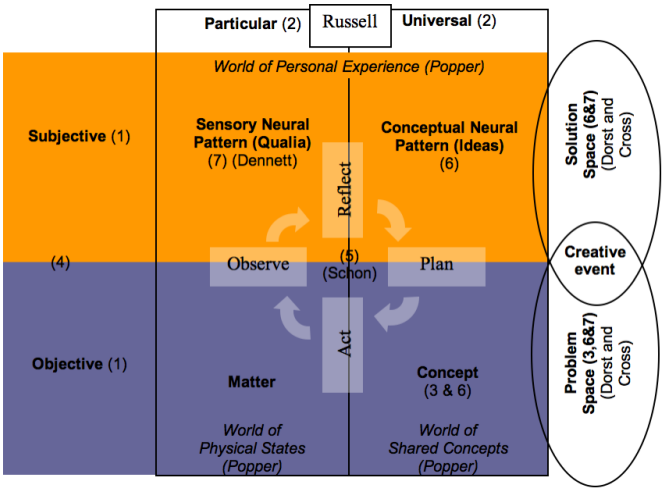

Figure 5. *A model for navigating 'fuzzy situations' in the design space (English, 2010).*

The authors contend that unobserved embedded values operating in the subconscious limit innovation potential. English (2006; 2007) suggests that the designer's awareness/consciousness is part of the design space. In this light, when presented with a design brief to design an iron, instead of asking just how to design an iron, a self-conscious designer would not include preconceived ideas and would ask how to remove creases from garments.

The experimental study expects to demonstrate whether a design-relevant mindfulness device, can effect significant transformation in mindful and cooperative attitudes in designers. Furthermore, it anticipates noteworthy correlations to be identified between independent facets of mindfulness and

that of cooperation modes. Lastly, the generated reflective output may inform on the kinds of values that emerge from designers moving between designing roles and other significant personal identities. The device contributes to design problem framing in that it allows the designer to navigate both conscious and unconscious values. Thus potentially imbuing the device and the concept with published research support to initiate an academic conversation regarding the device as a base for new academic design experiences. Future research can then explore refinements, self-contained interventions (as opposed to parallel engagement with other learning activities), further implications and long-term value.

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About the Authors:

Fernando Rojas is a post graduate researcher progressing within a doctoral programme at Northumbria University School of Design. He has co-authored academic papers in several international conferences that explore his topic of interest around integrating mindfulness and design.

f.rojas@northumbria.ac.uk | info@fmrojas.com

Stuart English is a specialist in design led innovation and leads a portfolio of postgraduate programmes at Northumbria University School of Design. His work on relational problem framing has initiated new methods, new products and new IP through an inclusive approach based on design led entrepreneurship.

stuart.english@northumbria.ac.uk

Robert Young is a Professor of Design Practice at Northumbria University. His research concerns design innovation practices, specifically building knowledge to support service design and social innovation. He coordinates the Northumbria DESIS Lab, which undertakes collaborative social innovation learning projects with public and third sector organisations.

robert.young@northumbria.ac.uk

Nicholas Spencer is the Programme Leader for the MA/MSc Multidisciplinary Innovation programme. His research aims to develop resilience within organisations and communities by establishing the capabilities and behaviours to respond positively to challenging situations by scoping and defining new growth opportunities using design-led practices.

nick.spencer@northumbria.ac.uk